ABSTRACT

An injection molding apparatus includes a nozzle body, a valve pin, a nozzle tip, a seal piece, and a mold gate insert. The nozzle body has a melt channel. The valve pin is at least partially positioned in the melt channel. The valve pin has a first guidance and alignment structure thereon. The nozzle tip is connected to the nozzle body. The seal piece is connected to the nozzle body. The mold gate insert defines a gate and is in contact with the seal piece. The nozzle tip has a higher thermal conductivity than the nozzle body. The seal piece has a lower thermal conductivity than the nozzle body. The mold gate insert has a higher thermal conductivity than the seal piece. The mold gate insert includes a second guidance and alignment structure thereon that contacts the first guidance and alignment structure before the valve pin contacts the gate.